

**Marked-up Version of Amendments**

**Submitted with Amendment; Response to Office Action Mailed July 10, 2002**

**In the Specification:**

On page 34, the paragraph beginning on line 29:

FIG. 133 depicts cumulative condensable hydrocarbons ~~and water~~ as a function of temperature produced by heating a coal cube;

On page 35, the three paragraphs beginning on line 15 (as amended in the Preliminary Amendment):

FIG. 144 depicts percentage ethene to ethane produced from a coal formation as a function of heating rate in ~~an experimental field~~ a laboratory test;

FIG. 145 depicts product quality of fluids produced from a coal formation as a function of heating rate in ~~an experimental field~~ a laboratory test;

FIG. 146 depicts weight percentages of various fluids produced from a coal formation for various heating rates in ~~an experimental field~~ a laboratory test;

On page 64, the paragraph beginning on line 11:

As shown in FIG. 3, in addition to heat sources 100, one or more production wells ~~102-104~~ will typically be disposed within the portion of the coal formation. Formation fluids may be produced through production well 104. ~~Production well 102 may be configured such that a mixture that may include formation fluids may be produced through the production well.~~ Production well ~~102-104~~ may also include a heat source. In this manner, the formation fluids may be maintained at a selected temperature throughout production, thereby allowing more or all of the formation fluids to be produced as vapors. Therefore high temperature pumping of liquids from the production well may be reduced or substantially eliminated, which in turn decreases production costs. Providing heating

at or through the production well tends to: (1) ~~prevent~~ inhibit condensation and/or refluxing of production fluid when such production fluid is moving in the production well proximate to the overburden, (2) increase heat input into the formation, and/or (3) increase formation permeability at or proximate the production well.

**In the Claims:**

1058. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heat sources to at least a portion of the formation;

allowing the heat to transfer from the one or more heat sources to a selected ~~section~~ pyrolysis zone of the formation;

controlling a pressure within the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than 25; and

producing a mixture from the formation.

1059. (amended) The method of claim 1058, wherein the one or more heat sources comprise at least two heat sources, and wherein superposition of heat from at least the two heat sources pyrolyzes at least some hydrocarbons within the pyrolysis zone ~~selected section~~ of the formation.

1064. (amended) The method of claim 1058, further comprising controlling a temperature within at least a majority of the pyrolysis zone ~~selected section~~ of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

1065. (amended) The method of claim 1064, wherein controlling the temperature comprises maintaining a temperature within the pyrolysis zone ~~selected section~~ within a pyrolysis temperature range.

1066. (amended) The method of claim 1058, further comprising controlling the heat heating rate such that an average heating rate of the pyrolysis zone~~selected section~~ is less than about 1 °C per day during pyrolysis.

1069. (amended) The method of claim 1058, wherein providing heat from the one or more heat sources comprises heating the selected formation such that a thermal conductivity of at least a portion of the pyrolysis zone~~selected section~~ is greater than about 0.5 W/(m °C).

1074. (amended) The method of claim 1058, wherein the produced mixture comprises ~~condensable hydrocarbons~~ a non-aqueous portion, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the non-aqueous portion~~condensable hydrocarbons~~ is nitrogen.

1075. (amended) The method of claim 1058, wherein the produced mixture comprises a non-aqueous portion~~condensable hydrocarbons~~, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the non-aqueous portion~~condensable hydrocarbons~~ is oxygen.

1076. (amended) The method of claim 1058, wherein the produced mixture comprises ~~condensable hydrocarbons~~ a non-aqueous portion, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the non-aqueous portion~~condensable hydrocarbons~~ is sulfur.

1085. (amended) The method of claim 1058, further comprising controlling the pressure within at least a majority of the pyrolysis zone~~selected section~~ of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

1088. (amended) The method of claim ~~1058~~ 1086, wherein controlling formation conditions comprises recirculating a portion of hydrogen from the mixture into the formation.

1091. (amended) The method of claim 1058, wherein allowing the heat to transfer comprises increasing a permeability of a majority of the pyrolysis zone~~selected section~~ to greater than about 100 millidarcy.

1092. (amended) The method of claim 1058, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the pyrolysis zone~~selected section~~.

1093. (amended) The method of claim 1058, further comprising controlling ~~the heat~~ heating rate to yield greater than about 60 % by weight of condensable hydrocarbons, as measured by the Fischer Assay.